

THE EFFECTS OF CONTINGENT AND NONCONTINGENT ATTENTION ON SELF-INJURY AND SELF-RESTRAINT

K. MARK DERBY, WAYNE W. FISHER, AND CATHLEEN C. PIAZZA

KENNEDY KRIEGER INSTITUTE AND
JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE

Self-restraint and self-injurious behavior (SIB) are two responses that can sometimes be members of the same functional response class (i.e., maintained by the same contingency). In such cases, a single treatment should be effective for both responses. In this investigation, we examined the effects of providing attention (the presumed reinforcer) both noncontingently and contingent upon either SIB or self-restraint. Results were consistent with our hypothesis that both responses were maintained by attention and suggested that noncontingent reinforcement was a potentially effective treatment.

DESCRIPTORS: self-restraint, self-injurious behavior, noncontingent reinforcement

Persons who exhibit self-injurious behavior (SIB) often display another aberrant response called self-restraint (Smith, Iwata, Vollmer, & Pace, 1992), which has received little attention in the literature. Like SIB, self-restraint interferes with the learning and performance of a variety of skills and can produce health complications.

The relationship between SIB and self-restraint, as well as the operant mechanisms involved in the maintenance of both behaviors, may vary across individuals. The cessation of SIB may be a negative reinforcer for self-restraint (Fisher, Grace, & Murphy, 1996). Self-restraint may be a positive reinforcer for SIB (Smith, Lerman, & Iwata, 1996). Finally, SIB and self-restraint may be maintained by either similar or different contingencies (Smith et al., 1992). For example, in one case described by Smith et al., results of a functional analysis indicated that SIB was maintained by escape from de-

mands and suggested that self-restraint was maintained by the same contingency. In the current case, we hypothesized that both SIB and self-restraint were maintained by contingent attention based on the results of a functional analysis of SIB. We then tested the hypothesis that these two behaviors were members of the same functional response class by alternately providing attention noncontingently or contingent upon either SIB or self-restraint.

METHOD

Mati, a nonverbal 12-year-old female with tuberous sclerosis, a seizure disorder, and profound mental retardation, was admitted to an inpatient unit for treatment of her severe SIB (hand- and knee-to-head blows) and self-restraint (holding onto the hand of another individual with both of her hands directly in front of her knees). A functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) indicated that SIB was sensitive to attention as a reinforcer (data available from the authors upon request). Her self-injury had resulted in bilateral detached retinas. One retina had been successfully reattached, giving her some vision only in that eye. Due to the risk of permanent blindness, Mati

This investigation was supported in part by Grant MCJ249149-02 from the Maternal and Child Health Service of the U.S. Department of Health and Human Services. The authors wish to acknowledge Whitney Johnson and Art Wilke for their assistance on this case.

Requests for reprints should be sent to Wayne Fisher, Neurobehavioral Unit, Kennedy Krieger Institute, 707 N. Broadway, Baltimore, Maryland 21205.

wore arm splints that prevented hand-to-face SIB, and staff members attempted to either block or lessen the impact of knee-to-face blows by placing a hand in front of Mati's knee as it approached her face. Therefore, the current analysis was conducted on attempted or partially blocked knee-to-face SIB and self-restraint.

Sessions, each lasting 10 min, were conducted in a living space on the inpatient unit. Observers recorded the frequency of attempted SIB and the duration of self-restraint on laptop computers. Interobserver agreement was assessed during 54% of sessions, and exact agreement coefficients averaged 90% for both SIB and self-restraint.

The effects of noncontingent attention (NCR) and attention applied contingent upon either SIB or self-restraint were evaluated using a reversal design. The evaluation took 13 working days to complete, and sessions were conducted in both the morning ($M =$ four per day) and afternoon ($M =$ three per day). During NCR, the therapist provided verbal (enthusiastic praise and other positive verbalizations) and physical (e.g., rubbing or patting her upper body or head) attention on a continuous or nearly continuous basis, blocked SIB, and ignored self-restraint. During the attention to SIB phases, attention in the form of a verbal reprimand (i.e., "Stop that or you will hurt yourself") was provided contingent upon occurrences of SIB, and self-restraint was ignored. During the attention to self-restraint phases, verbal and physical attention were provided contingent upon each occurrence of self-restraint and continued until the behavior stopped, and SIB was blocked. During all conditions, physical attention was supplied in a manner that did not physically prevent SIB or self-restraint.

RESULTS

During the first NCR phase, SIB averaged 1.6 responses per minute and self-restraint

occurred, on average, during 6.2% of the session time (see Figure 1). During the next two NCR phases, SIB ($M_s = 0.9$ and 0.31 , respectively) and self-restraint ($M_s = 10.6\%$ and 0.26% , respectively) continued to occur at low levels. During the two attention to SIB phases, self-restraint was low ($M_s = 3.7\%$ and 1.6% , respectively) and SIB occurred at high ($M = 12.8$) and moderate rates ($M = 4.3$), respectively. During the attention to self-restraint phases, the duration of self-restraint was at higher levels ($M_s = 38\%$ and 36% , respectively) than during the other two conditions, and SIB occurred at moderate rates ($M_s = 5.2$ and 4.3).

DISCUSSION

Results of this investigation are consistent with the hypothesis that SIB and self-restraint were maintained by the same contingency (i.e., attention). Attention provided contingent upon SIB resulted in increases in SIB, while self-restraint remained low. Attention provided contingent upon self-restraint resulted in increases in both SIB and self-restraint. Noncontingent attention resulted in near-zero levels of SIB and self-restraint.

It is not clear why SIB increased when attention was provided contingent upon self-restraint, but no parallel increase in self-restraint occurred when attention was provided for SIB. Historically, caregivers consistently attended to Mati's SIB due to its severity and the risk of blindness. Further, caregivers may have been more likely to encourage and attend to self-restraint when it followed SIB because self-restraint interfered with SIB. Thus, it is possible that SIB and self-restraint were the first and second components of a response chain. In general, when two responses form a response chain, the two behaviors are positively correlated; however, this was not the case for SIB and self-restraint in the attention to self-restraint phase. In fact,

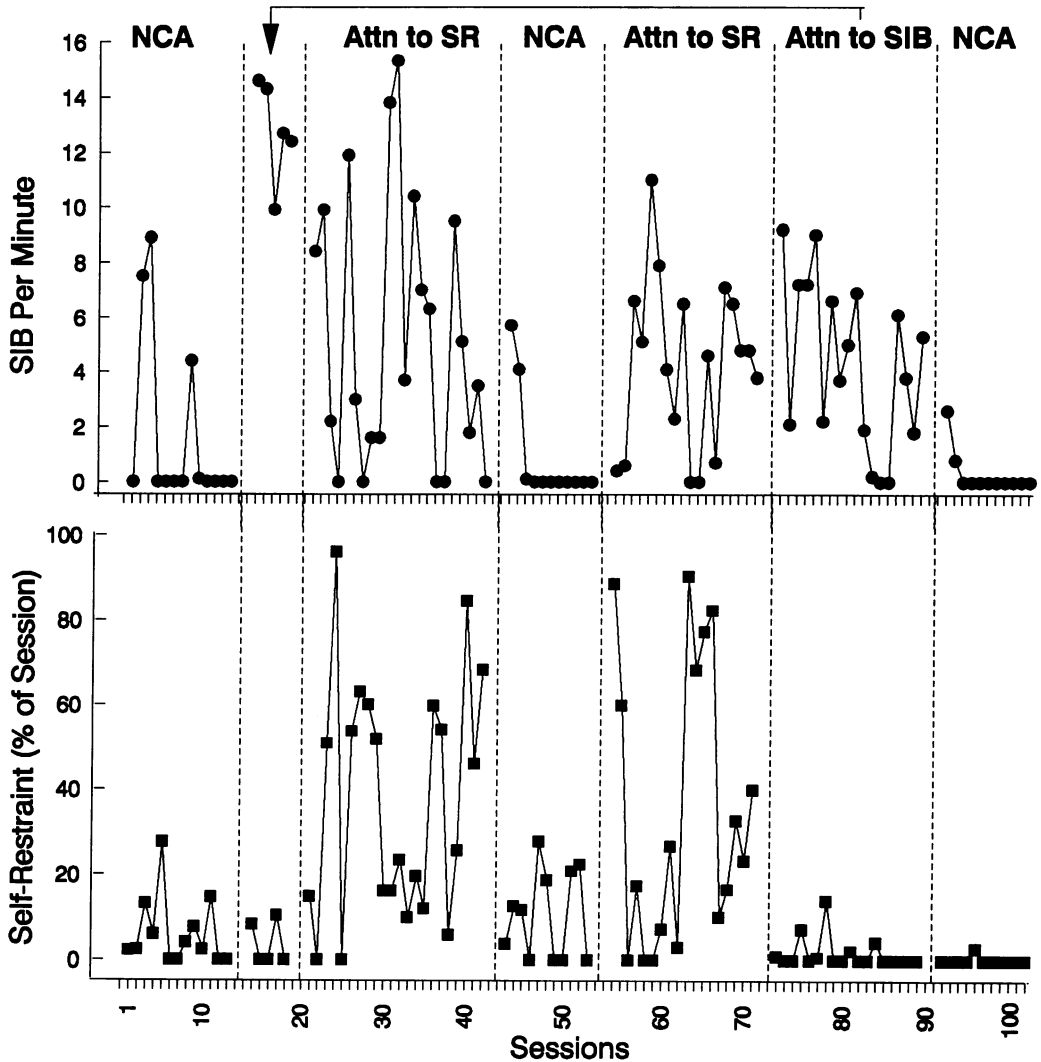


Figure 1. The rate of self-injurious behavior and duration of self-restraint under the conditions of noncontingent reinforcement (NCR), attention to self-restraint (Attn to SR), and attention to SIB (Attn to SIB).

SIB and self-restraint appeared to be negatively correlated during this phase, probably because self-restraint was topographically incompatible with SIB. Nevertheless, without objective data on the reinforcement histories of SIB and self-restraint for this client, the response chain explanation for these results remains speculative.

NCR was used as the control condition in this case to help determine its potential as a treatment for SIB and self-restraint, and because extinction was contraindicated. Ma-

ti's ophthalmologist had indicated that blows to the head could result in irreparable retinal damage and permanent blindness. Bursts of aberrant behavior occur less frequently with NCR than with extinction because, with NCR, the establishing operation for the behavior is removed (Vollmer, Iwata, Zarcone, Smith, & Mazaleski, 1993). Another reason for the use of NCR with this particular client was that Mati always received some amount of attention from SIB (i.e., staff were required to block SIB) and from self-

restraint (i.e., her self-restraint consisted of holding onto the hand of another person). Based on observations conducted on the living unit, it appeared that these small amounts of attention were sufficient to maintain SIB and self-restraint. Thus, these results suggest that NCR may be a potentially effective treatment for attention-maintained aberrant responses that cannot be ignored completely due to health risks or other factors.

REFERENCES

- Fisher, W. W., Grace, N. C., & Murphy, C. (1996). Further analysis of the relationship between self-injury and self-restraint. *Journal of Applied Behavior Analysis*, 29, 103–106.
- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis*, 27, 197–209. (Reprinted from *Analysis and Intervention in Developmental Disabilities*, 2, 3–20, 1982)
- Smith, R. G., Iwata, B. A., Vollmer, T. R., & Pace, G. M. (1992). On the relationship between self-injurious behavior and self-restraint. *Journal of Applied Behavior Analysis*, 25, 433–445.
- Smith, R. G., Lerman, D. C., & Iwata, B. A. (1996). Self-restraint as positive reinforcement for self-injurious behavior. *Journal of Applied Behavior Analysis*, 29, 99–102.
- Vollmer, T. R., Iwata, B. A., Zarcone, J. R., Smith, R. G., & Mazaleski, J. L. (1993). The role of attention in attention-maintained self-injurious behavior: Noncontingent reinforcement and differential reinforcement of other behavior. *Journal of Applied Behavior Analysis*, 26, 9–21.

Received January 25, 1995

Final acceptance August 16, 1995

Action Editor, Brian A. Iwata